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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/625,094	07/25/2000	Frederick M. Discenzo	00RE089	6257

7590 06/16/2004

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EXAMINER	
LEE, HWA S	

ART UNIT	PAPER NUMBER
2877	

DATE MAILED: 06/16/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/625,094	DISCENZO, FREDERICK M.	
	Examiner	Art Unit	
	Andrew H. Lee	2877	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *24 March 2004*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-21,24-27 and 37-43* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☐ Claim(s) *1-21,24-27 and 37-43* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 1-12, 14-21, and 24-27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Dunphy et al (US 5,399,854) in view of Kersey et al (5,361,130) and Thomas et al (4,460,893).

Dunphy et al (Dunphy hereinafter) show an embedded optical sensor capable of strain and temperature measurement comprising:

a least one optical fiber (21) embedded in a sample to be measured, the at least one optical fiber being adapted to transmit light from a light source; and

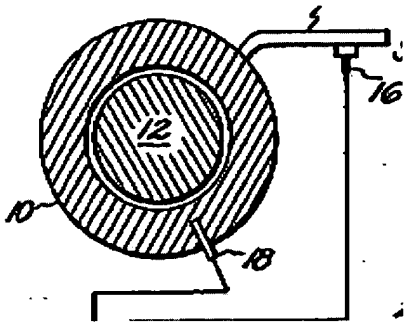
an interferometric system (28) operatively couple to the optical fiber and a processor;

wherein the interferometer system provides information relating to at least one condition of the bearing , and a state of the at least one condition of the sample based on the information is determined.

Dunphy does not expressly show a processor and does not show that the sample being measured is a bearing.

Kersey et al shows a fiber optic sensing system having a processor. At the time of the invention, one of ordinary skill in the art would have used a processor with Dunphy in order to count and convert the fringe signals from the sensors into the temperature that is being indicated by the sensor.

As for the bearing, Thomas et al (Thomas hereinafter) shows a sensor (18) embedded in a bearing (10) to monitor the bearing temperature wherein in the sensor (18) is embedded parallel to the direction of wear of the bearing (10).



At the time of the invention, one of ordinary skill in the art would have replaced the sensor of Thomas with the fiber optic sensor of Dunphy in order to have a simpler sensor having a wider range of temperature measurement, and also measures temperature more accurately.

As for claims 2, 10, 16 Thomas show that monitoring the temperature of the bearing indicates the rate of wear of the bearing (Abstract).

As for claims 4 and 5, Dunphy shows that a reference beam and a measurement beam in created and that an interference beam in created by the reflected reference and measurement beam.

As for claims 8 and 9, none of the cited reference show that the bearing is a ball bearing, hydrodynamic, double row ball, and thrust bearings however, those types of bearings are notoriously well known. At the time of the invention, one of ordinary skill

in the art would have used sensors in a ball bearings to monitor the condition of the bearings.

As for claim 15, please see Figure 7 of Kersey.

As for claim 16, none of the references show that the sensor end of the fiber is flush with a contacting surface of the bearing, however, Thomas teaches that the sensor should be place as close as possible to the load bearing point, therefore one of ordinary skill in the art would have been motivated to place the sensor flush with the contacting surface of the bearing since that point is a load bearing point in order to obtain the most accurate measurement of the temperature of the load bearing point.

3. Claims 13, 27, 37-43 is rejected under 35 U.S.C. 103(a) as being unpatentable over Dunphy, Kersey and Thomas as applied to claims 1-12, 14-21, and 24-27 above, and further in view of Ide (5,382,097).

Dunphy, Kersey and Thomas do not show an actuator.

Ide shows a smart bearing comprising an actuator. At the time of the invention, one of ordinary skill in the art would have modified Dunphy, Kersey and Thomas with an actuator of Ide in order to maintain proper bearing support while monitoring the pressure environment of the sensor(column 17, lines 47+).

Response to Arguments

1. Applicant's arguments filed 3/24/04 have been fully considered but they are not persuasive. In response to applicant's argument that the combination of Dunphy and Thomas do not show "an optical fiber embedded in a bearing" because the Dunphy shows

that the optical fiber is first embedded in a plurality of layer and thus not in the bearing, the examiner disagrees. The examiner agrees that combination would result in the optical fiber being embedded in the plurality of layers, however, the combination would still result in the fiber being embedded in the bearing although fiber will not be directly in contact with the bearing.

2. With regards to applicant's argument that the fiber would not be flush with the contact surface, the examiner disagrees since Thomas shows a motivation to place the sensor as close as possible to the load bearing point, therefore one of ordinary skill in the art would have been motivated to place the sensor flush with the contacting surface of the bearing since that point is a load bearing point in order to obtain the most accurate measurement of the temperature of the load bearing point. Even though figure 2 does not expressly show the sensor flush with the contact surface, one of ordinary skill in the art would recognize that there would be a lag in sensing the further the sensor is away from the surface. And with the teaching from Thomas that the sensor should be placed close to the load bearing point, one of ordinary skill would have place the sensor at the surface. The examiner recognizes that the present invention operates in a very different way in that the present invention monitors wear and wear rate, however a recitation of the intended use of the claimed invention must result in a structural difference between the claimed invention and the prior art in order to patentably distinguish the claimed invention from the prior art. See *In re Casey*, 152 USPQ 235 (CCPA 1967) and *In re Otto*, 136 USPQ 458, 459 (CCPA 1963). It is noted that the features upon which applicant relies (i.e., monitor wear and wear rate) are not recited in the rejected claim(s). Although the claims are interpreted in light of the specification, limitations from the

specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).

3.

Conclusion

4. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Papers related to this application may be submitted to Technology Center (TC) 2800 by facsimile transmission. Papers should be faxed to TC 2800 via the PTO Fax Center located in CP4-4C23. The faxing of such papers must conform with the notice published in the Official Gazette, 1096 OG 30 (November 15, 1989). The CP4 Fax Center numbers are 703-872-9306 for regular communications and for After Final communications

If the Applicant wishes to send a Fax dealing with either a Proposed Amendment or for discussion for a phone interview then the fax should:

a) Contain either the statement "DRAFT" or "PROPOSED AMENDMENT" on the Fax Cover Sheet; and

b) Should be unsigned by the attorney or agent.

This will ensure that it will not be entered into the case and will be forwarded to the examiner as quickly as possible.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0956.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Patrick Connelly whose telephone number is (703) 305-0538. The examiner can normally be reached on M-Th. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Frank Font can be reached on 703-308-4881.

Andrew Lee
Patent Examiner
Art Unit 2877

June 8, 2004/ahl

Frank G. Font
Supervisory Patent Examiner
Technology Center 2800